

would give an amount of something like 800, and he did not hesitate to say it would save them 10,000. (loud laughter.) We suspect that some at least of the Preston council do require to get up a little "cultivation of their minds" previous to the issue of the proposed advertisement.

Dunstable.—A meeting of ratepayers and other inhabitants has been held, at which it has been resolved, as the opinion of the meeting, that the existing water power, if applied in the most efficient manner, would be amply sufficient for the supply of the town according to the requirements of the Health of Towns Act, and at the same time the most economical mode of effecting that object. A memorial to the Board on the subject was unanimously agreed to.

Leeds.—Messrs. Peter Fairbairn and Co., the machine makers, have purchased for the use of their workmen, as a means of affording them agreeable recreation, a stock of Saxo horns and other instruments, which will form one of the largest and most effective brass bands in that part of the country. The instruments are of the same description as those used by the Distin family. Mr. Whitley, leader of the Bramley band and of the Leeds troop of Yorkshire Hussars, is appointed teacher of the new band.

Gateshead.—The project of a market for Gateshead is likely to be again brought under consideration. "The Island," in the main thoroughfare, is recommended by the *Observer* as the best site for such a work.

Gateshead.—A Dumfries paper states that a vein of copper ore, 18 feet wide, was lately found at Laggan, in the parish of Anwoth, near Gateshead, by a labourer, while pulling heather. The whole district, it is said, teems with metal.

Dunkeld.—"A contract," says the *Perth Courier*, "was some time ago entered into with the patentee of the new discovery of 'water gas' for lighting the streets, shops, and dwelling-houses of Dunkeld. The necessary preparations have now been completed, and a preliminary trial made in presence of the patentee, Dr. Miller of Manchester, and other gentlemen interested in the gas manufacture. There is neither smell nor smoke emitted from the gas, nor during the manufacture. The comparative cheapness is also an important element in the question; and the more so, in a town of limited extent and trade such as this." Under Dr. Miller's patent, hydrogen, as we think has been already explained to our readers, is first extracted in a retort from water and then loaded with carbon in another retort. The hydro-carbons are a curious and interesting class of bodies. They not only comprise the various qualities of illuminative gas, oilfiant, &c., but, in proportion as the hydrogen which unites them becomes more and more loaded with the carbon, they sink into fluids more and more dense, from subtle ether and alcohol, through the naphthas and turpentine, and at length pass into the solid naphthalene, with their beautiful white crystalline laminae, smelling like the flower narcissus, and susceptible of incandescence, also into paraffine, and ultimately Cannel and other coals, which, in fact, are still hydro-carbons. Now the idea of first preparing the volatilizing hydrogen and then loading it with carbon, till a sufficiency be converted into gas that will burn brilliantly, as ordinary gas does, to a certain extent at least, in proportion to the amount of carbon with which it is loaded, is certainly ingenious; but still more so, as well as probably far more practicable and economical, is that which it farther suggests of first merely driving out of common coal a hydro-carbonic gas of low illuminative power, and then enriching it by the aid of Cannel coal, the richest of coals in hydro-carbonaceous properties. An approximation to this idea was made by Mr. White, in his alleged preparation of hydrogen from water into hydro-carbonaceous gas by the aid of resinous substances, which are just a sort of solid though partially-oxidized turpentine; but it seems to have been left to our correspondent, "C. C.," to mature the idea of enriching the highly carbonized hydro-carbon of Cannel coal with highly hydrogen-

ized hydro-carbonaceous gas, or gas of low illuminative power, at first prepared, and so, easily and readily, to form a brilliant illuminative gas, rich in carbon. Perhaps the only hope of additional advantage, economy, and convenience, in this species of experiment, consists in the possibility that even common coal so treated, by passing meagre gas over it while it is in a heated state in a separate retort, may enrich the gas, so treated, as much as Cannel coal does, if not even more so, though it may not increase it so much in quantity as the Cannel is capable of doing. We have frequently predicted vast improvements in the distillation of coal gas, and are likely, it would appear, to see the prediction very soon fulfilled.

HOW THE WORK WAS DONE ON THE BIRMINGHAM AND OXFORD EXTENSION.

At a recent meeting of the Institute of Engineers, an account was given of the works on the Birmingham Extension of the Birmingham and Oxford Junction Railway, by Mr. C. B. Lane. The reader said the line was intended to form the connecting-link between the Birmingham and Oxford, and the Birmingham, Wolverhampton, and Dudley, and so complete the broad gauge circuit with Bristol and the south-west of England. The line commenced near the Coventry-road, and was to have terminated at Great Charles-street. From Adderley-street to Park-street, both inclusive, the town was crossed by a viaduct; and from Moor-street to Monmouth-street, the line passed under the highest of the eminences on which Birmingham stands, by means of a tunnel, which was to have been constructed as a covered way—that is, by opening the ground, putting in the brickwork, and again covering up; and the part of it as yet completed, from Moor-street to High-street, being about 142 yards in length, was executed in this manner. It was 27 feet in width at the level of the rails, and was built entirely of Staffordshire brick set in mortar, with the exception of the arch lengths through Carr's-lane, which were set in cement. The average rate of progress in the tunnel was 8.1 lineal yards per week.

The viaduct consisted of fifty-seven openings, composed of nine segments, each 30 feet span and 6 feet rise; fifteen semi-circles, also 30 feet span and 15 feet rise; twenty-seven semi-ellipses, each 15 feet rise, and varying in span from 37 feet to 48 feet, and six street bridges, mostly skew, and varying in form, span, and rise. Its total length was 930 yards; general width, from face to face, 31 feet 7½ inches; and between the parapets at the level of the rails, 29 feet. It was built entirely of brickwork set in mortar, with the exception of the soffit of the bridge over Park-street, which was constructed of cast-iron girders, with a cross-transomed metal flooring. The red brick of the district was used throughout the footings, the internal work of the piers, and the spandril walls: the arches and parapets were constructed of Staffordshire brick, from the "common stock"—the copings, mouldings, and dentils being made of Staffordshire brick clay; and the whole of the work was faced with Staffordshire "best blue." All the brickwork was set in moist mortar, so as to press to a thin joint; and in hot weather the bricks were kept constantly wet. The mortar used in the work was composed of the red sand of the locality, and Dudley or Greaves' blue lias lime, the latter being used in all foundations, arches, and face-work, mixed in the proportions of one part of slaked lime to two parts of sand, and worked by a steam-mill driven by a four-horse power steam-engine, made by Mr. Nathan Gough, of Manchester. This mill was capable of supplying fifty bricklayers per day with a mortar of a perfectly even texture, entirely free from lumps, and therefore less likely to become vesicular, from the transpiration of water, than that mixed by the common pug-mill. Each set of centres consisted of five ribs, each rib being supported on two vertical, and two sloping props, the former under the heels of the ribs, and the latter under the points, where the struts of the ribs terminated in an iron shoe. The laggers used

were 2-inch deals, carefully dressed by the adze to the proper curves, and lined in the courses of the skew arches. Corbels of heading bricks were carried out from the backs of the arches in the range of the spandril walls, of equal width with them, and connected by brick beams from arch to arch, for stiffening and equalizing the pressure from end to end of the viaduct; and the useful effect of this mode of construction was proved by the comparatively small amount of the settlements of the arches.

The various modes adopted, and mechanical contrivances used, for raising the materials to a considerable height, were described; and deductions were drawn from a very numerous series of experiments, to ascertain the values for the useful effect produced by the "labouring force" (Whewell), or "Travail Mécanique" (Poncelet), of a man under different modes of its application, and also for a horse under alternating motion over a short space. From these it appeared, that the relative costs of raising the materials to a height of 46 feet, by the horse-lift, the swing-lift, and the box-lift, were 3'08, 5'90, and 4'13 pence per ton respectively, showing a saving in favour of the horse-lift against the swing-lift of nearly 3d. per ton, and against the box-lift of rather above 1d. per ton.

RAILWAY JOTTINGS.

THE aggregate amount of traffic on railways in the United Kingdom, published weekly from 1st January to 20th December, inclusive, amounted to 14,297,705½; corresponding period of 1850, to 12,513,625½; corresponding period of 1849, 10,823,221½; and in 1848, 9,858,770½.—The number of parcels passing "in" and "out" of the Euston-square terminus, during the Christmas week, has amounted to nearly 40,000. Out of these 40,000 parcels only two had the addresses lost. One of the trains brought up ten tons of poultry.—A Bill for an Oxford and Brentford line has been deposited, it appears, by the Oxford, Worcester, and Wolverhampton Company. Messrs. Peto and Betts have put their names down, it is said, for 400,000l., Messrs. Tredwells for 200,000l., and the solicitor for 28,400l.—Mr. R. Stephenson is reported to have completed the survey of the Cairo railway. His decision is announced to be that the plan suggested by the Pacha for carrying the work through the Delta should be followed out. Instead of the costly bridge-work proposed across the two branches of the river, it is probable a pontoon, or floating stage, will be used for carrying the rails. 18,000 labourers, supplied from the respective bordering districts, will be set to work immediately.

RESOURCES OF IRELAND.

ENCOURAGED by railroad and packet-station works, the interests of Ireland generally, and of the county Galway in particular, have recently been much stimulated—property in the borough has acquired an increased value, and resources hitherto neglected are being brought into play: this, together with the prospect of a regular line of packets between New York and the noble harbour of the west, promise a future most cheering for the province of Connaught, heretofore the poorest portion of the kingdom.

With a communication by rail of five hours to Dublin and Belfast, and a continued line of transit via Holyhead to Liverpool and London, this route cannot fail to be adopted as the most direct postal medium, as well as for the despatch of light merchandise, since a saving of three days will be effected, as contrasted with the voyage round Cape Clear, the Lizard, Foreland, the Downs, and the beating up channel. A submarine telegraph between Howth and Holyhead must limit all governmental correspondence to this line.

It will be a novel feature in statistics, if the emigrant hordes which fled misery and famine in their native land, shall be replaced by industrious English, Welch, and Scotch, who may settle in the desolate soil, where they will